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Preliminary

Features

- Fast Access Time Selection:
100ns/120ns/150ns/200ns
- Direct Replacement for NMOS 2114 RAMs
- 883 Qualified Version: 883/2114ALM
- Three-State Outputs
- True TTL Compatibility
- Single 5V $\pm$ 10% Supply
- Fully Static Asynchronous Operation
- Three-State Outputs
- Common Data I/O Bus

Description

The SCM2114AL is a static silicon-gate CMOS RAM, a direct replacement for the NMOS 2114 4K RAM. The device is fully static and requires no clocks.

The Common Data lines (I/O) allow for simple interfacing with most microprocessors. A Chip Select input ($\overline{CS}$) is provided for memory expansion. The I/O lines are in a high impedance state when the chip is not selected ($\overline{CS} = 1$). The Write Enable ($\overline{WE}$) is used to select either the read ($\overline{WE} = 1$) or write ($\overline{WE} = 0$) mode.

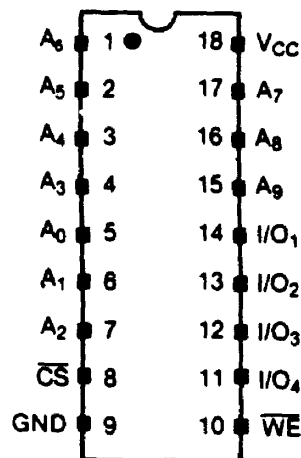
The SCM2114AL is fully socket and spec compatible with NMOS 2114 RAMs. For applications where $\overline{CS}$ and address access timing can be coincident, even lower power can be achieved using the SCM21C14 which features a standby current of 50 μ A max.

The SCM2114AL is available in industry standard 18 pin packages. The different versions of the SCM2114AL are outlined below.

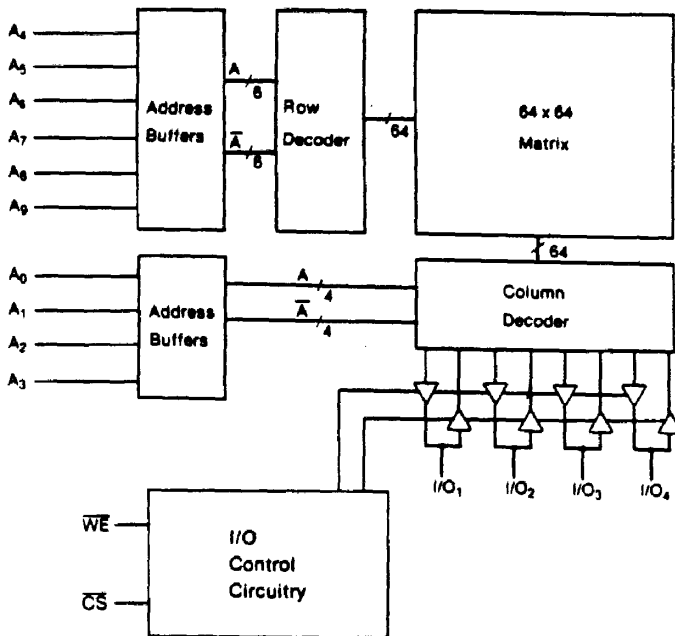
Operating Characteristics Summary

Type	Access Time t_A (max.)	Operating Current I_{CC} (max.)
SCM2114AL-1	100ns	40mA
SCM2114AL-2	120ns	40mA
SCM2114AL-3	150ns	40mA
SCM2114AL-4	200ns	40mA
SCM2114ALM	200ns	50mA
883/2114ALM	200ns	50mA

Pin Configuration



Block Diagram



Absolute Maximum Limits

DC Supply Voltage (V_{CC}):	- 0.5 to + 6.0V
Storage Temperature (T_S):	- 65° to + 150°C
Input Voltage (V_{IN}):	$(V_{SS} - 0.3V) \leq V_{IN} \leq (V_{CC} + 0.3V)$

Recommended Operating Conditions

Parameter	Limits
DC Supply Voltage (V_{CC})	5V $\pm$ 10%
Operating Temperature (T_A)	
2114AL-1/-2/-3/-4	0° to + 70°C
2114ALM	- 55° to + 125°C

Pin Description

A_{0-9}	Address Inputs
$\overline{CS}$	Chip Select
$\overline{WE}$	Write Enable
I/O_{1-4}	Data In/Out

Truth Table

$\overline{CS}$	$\overline{WE}$	I/O_{1-4}	Mode
1	X	High Z	Not Selected
0	1	Outputs	Read
0	0	Inputs	Write

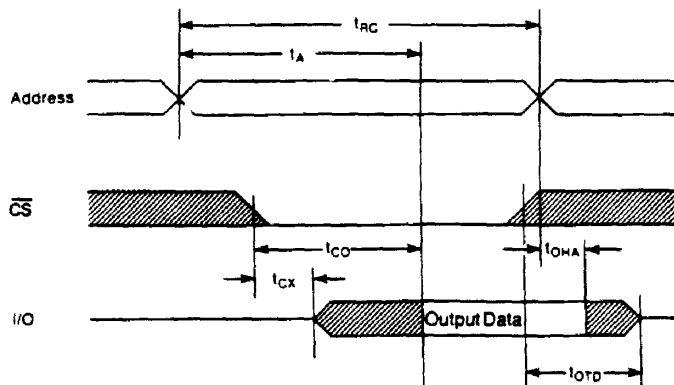
D. C. Characteristics ($V_{CC} = 5V \pm 10\%$)

Symbol	Parameter	Min.	Typ. ⁽¹⁾	Max.	Units	Test Conditions
I_{LI}	Input Current			1.0	μA	
I_{LO}	Output Leakage Current			1.0	μA	
V_{IL}	Input Low Voltage			0.8	V	
V_{IH}	Input High Voltage	2.0			V	
V_{OL}	Output Low Voltage			0.4	V	
V_{OH}	Output High Voltage	2.4			V	
I_{CC}	Operating Current 2114AL		25	40	mA	$I_{OL} = 3.2mA$
I_{CC}	Operating Current 2114ALM		25	50	mA	$I_{OH} = -1.0mA$
						$V_{IH}/V_{IL} = 2.0/0.8V$
						$V_{IH}/V_{IL} = 2.0/0.8V$

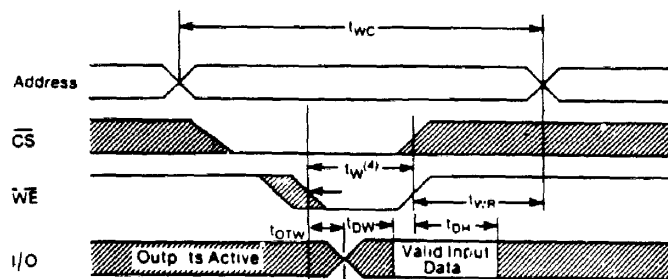
A. C. Characteristics⁽²⁾ ($V_{CC} = 5V \pm 10\%$)

Symbol	Parameter	2114AL-1 Min. Max.	2114AL-2 Min. Max.	2114AL-3 Min. Max.	2114AL-4/M Min. Max.	Units
Read Cycle						
t_{RC}	Read Cycle	100	120	150	200	ns
t_A	Access from Address		100	120	150	ns
t_{CO}	Chip Select to Output Valid		50	70	70	ns
t_{CX}	Chip Select to Output Active	5	5	5	5	ns
t_{OTD}	Chip Select to Output Float		30	35	40	ns
t_{OHA}	Output Hold from Address Change	5	5	5	5	ns
Write Cycle						
t_{WC}	Write Cycle	100	120	150	200	ns
t_W	Write Pulse Width	50	70	90	120	ns
t_{OW}	Data Setup	50	70	90	120	ns
t_{OH}	Data Hold	0	0	0	0	ns
t_{OTW}	Write to Output Float		30	35	40	ns
t_{WR}	Write Recovery	0	0	0	0	ns

Read Cycle (3)



Write Cycle



1. $T_A = 25^\circ\text{C}$; $V_{CC} = 5.0\text{V}$
2. A.C. TEST CONDITIONS

Input Pulse Levels: 0.8 to 2.4V
 Input Rise/Fall Times: $\leq 10\text{ns}$
 Time Measurement Reference Level: 1.5V
 Output Load: 1 TTL Load and $C_L = 100\text{pF}$

3. $\overline{WE}$ is high for a read cycle.
4. t_W is measured from the latter of $\overline{CS}$ or $\overline{WE}$ going low to the earlier of $\overline{CS}$ or $\overline{WE}$ going high. $\overline{WE}$ must be high during address transitions.